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## PATENT SPECIFICATION

476,089



Application Date : Feb. 13, 1937. No. 4382/37.

Complete Specification Accepted : Dec. 1, 1937.

### COMPLETE SPECIFICATION

#### Internally Cooled Valve for Internal Combustion Engines

We, MOTORAKTIESELSKAPET av 1935, a company organized under the laws of Norway of Kongensgate 6, Oslo, Norway, and COURT GROSS of Rosenborggaten 13c, Oslo, Norway, of Norwegian nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It has been suggested to cool the valves of internal combustion engines by means of a fluid such as air or gas or a liquid, but the known devices have the drawback that the cooling agent has either been caused to pass along the exterior surfaces of the valve on the parts thereof located in the channel controlled by the valve, or has been supplied to internal cooling channels in the valve and let out of the valve adjacent these parts, for instance through holes in the valve head.

Further, in a valve for internal combustion engines having a solid stem and a piston attached thereto, it has been proposed to actuate the latter by means of the pressure fluid used for cooling purposes.

The invention consists in the combination with a valve for internal combustion engines, of a pressure fluid cylinder co-operating with a piston secured to the valve stem for operating the valve, and of internal cooling fluid channels in the valve communicating with said fluid pressure cylinder for supplying pressure fluid to the interior of the valve for cooling the same.

When the valve cooling is carried out in the above described manner the pressure fluid for instance, air, which after having cooled the valve, is let out into the atmosphere or the cooling air may be drawn through the valve by connecting the outlet opening for the cooling air with some part of the intake conduit to the engine in which there is created a suction effect.

The cooling fluid may pass through a suitable opening leading from the valve interior to the pressure air cylinder.

The valve rod may be surrounded by a stationary sleeve about which the pressure

air piston fits tightly in such a manner that the pressure air piston will automatically close the passage from the pressure air cylinder to the interior of the valve at times when it is important to maintain the highest possible pressure in the pressure air cylinder.

In the accompanying drawing is illustrated a diagrammatic section view through an air cooled valve.

In this drawing 6 is the valve, the hollow valve rod 1 of which is also provided with two openings 2 and 3 for the cooling air, the valve rod being surrounded by a pressure air cylinder 7 with pressure air supply passage 5 and further carries piston 8 which serves to replace wholly or partly valve springs.

The valve rod is further surrounded by the stationary sleeve 9, which is provided on its inner surface with a groove 10 connected with the pressure air cylinder 12 through the narrow opening 11.

The movement of the cooling air inside the valve is controlled by means of the helical guiding strip 4, but when the valve with its piston 8 moves downwards, opening 11 is closed by means of the lower edge of the piston 8 so that no air is lost and no corresponding decrease of pressure is caused at the moment in which it is important to have the strongest possible upward force acting on piston 8.

As it will be understood, the cooling may also be carried out by means of a liquid such as oil, said cooling oil being in that case collected after having passed the valve so that it may be used again.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a valve for internal combustion engines, the combination of a pressure fluid cylinder co-operating with a piston secured to the valve stem for operating the valve, and of internal cooling fluid channels in the valve communicating with said fluid pressure cylinder for supplying pressure fluid to the interior of the valve for cooling the same.

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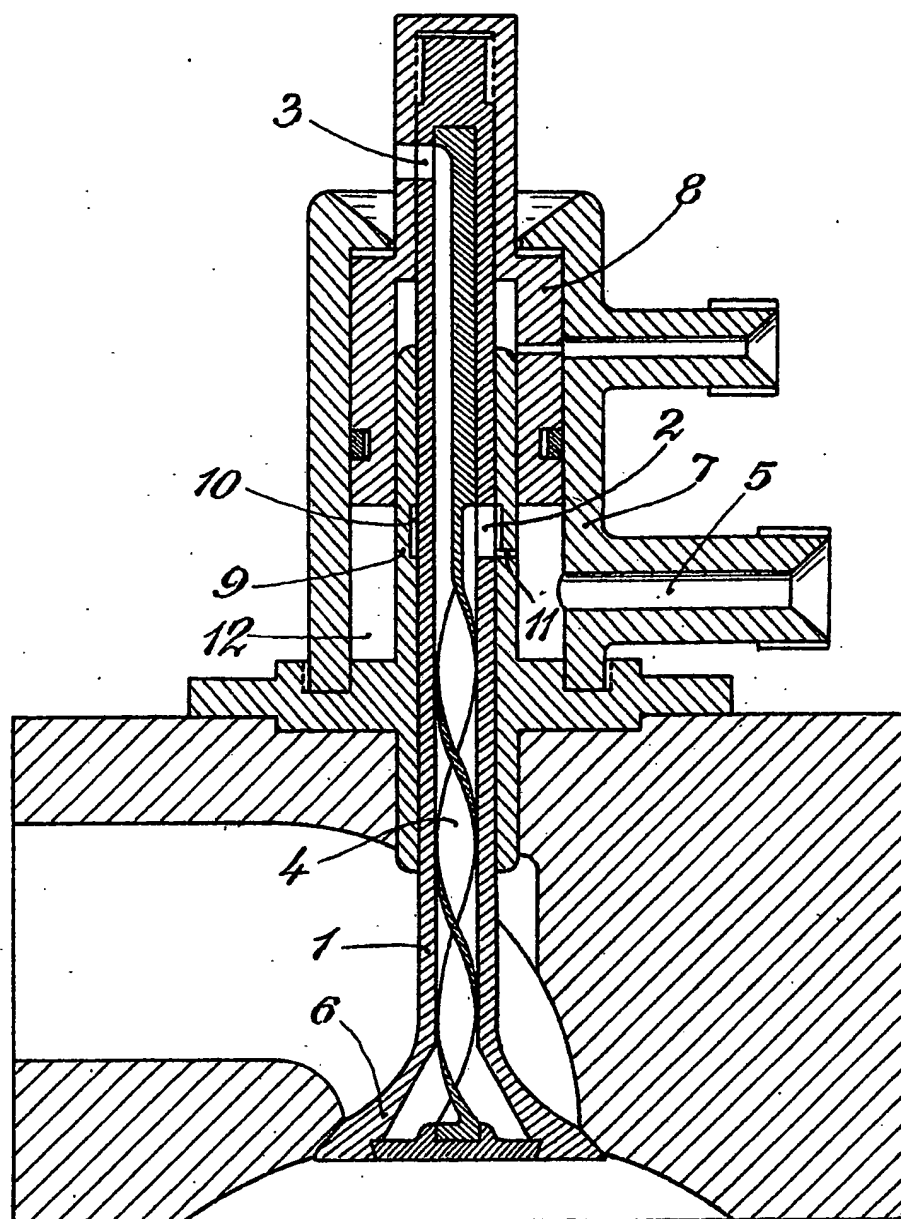
2. The fluid cooled valve for internal combustion engines substantially as described and shown in the accompanying drawing.

Dated this 13th day of February, 1937.

MARKS & CLERK.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1937.

[This Drawing is a full-size reproduction of the Original.]



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